

What is claimed is:

1. A gas supplying apparatus for atomic layer deposition, which generates a source gas by vaporizing a powder source and supplies the source gas  
5 into a reaction chamber of an atomic layer deposition apparatus, the apparatus comprising:
  - a container containing the powder source;
  - a cover, which is installed in an upper portion of the container and covers the container;
  - 10 a gas inlet tube, which supplies a carrier gas into the container and includes a preheating portion wound on an outer circumference of the container and a connection portion for connecting the preheating portion and a carrier gas storage tank;
  - a gas outlet tube, which exhausts the source gas generated in the container  
15 together with the carrier gas;
  - a heating unit, heating the container and the preheating portion of the gas inlet tube together;
  - a temperature sensor, which detects temperature in the container; and
  - a temperature controller, which controls a power supply of the heating unit  
20 depending on a value of temperature detected by the temperature sensor.
2. The apparatus of claim 1, wherein the heating unit is a heater, which is installed to surround the container and the preheating portion of the gas inlet tube.  
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3. The apparatus of claim 2, further comprising a casing, which surrounds the heater and the container for protection.
4. The apparatus of claim 3, wherein the casing is formed of an  
30 adiabatic material, so as to prevent heat generated in the heater from dissipating outside.
5. The apparatus of claim 3, wherein an adiabatic material is attached

inside the casing such that heat generated in the heater is prevented from dissipating outside.

6. The apparatus of claim 1, wherein the heating unit is a heater,  
5 which is supported by the cover, is placed in the container, and heats the container.

7. The apparatus of claim 6, further comprising a casing, which surrounds the heater and the container for protection.

10 8. The apparatus of claim 6, wherein the casing is formed of an adiabatic material, so as to prevent heat generated in the heater from dissipating outside

9. The apparatus of claim 6, wherein an adiabatic material is attached  
15 inside the casing such that heat generated in the heater is prevented from dissipating outside.

10. The apparatus of claim 1, further comprising a casing, which surrounds the container and the preheating portion of the gas inlet tube,  
20 wherein the heating unit comprises:  
a working fluid, which is filled in a space between the container and the casing; and  
a thermoelectric device, which is installed to contact an outside of the casing thermally and heats the working fluid.

25 11. The apparatus of claim 10, wherein the thermoelectric device is installed to contact a bottom surface of the casing thermally.

12. The apparatus of claim 10, wherein the thermoelectric device is a  
30 Peltier device.

13. The apparatus of claim 10, wherein a thermal conductive material is interposed between the casing and the thermoelectric device.

14. The apparatus of claim 13, wherein the thermal conductive material is a thermal compound or a thermal pad.

15. The apparatus of claim 1, wherein the preheating portion of the gas inlet tube is wound several times along an outer circumference of the container.

16. The apparatus of claim 1, wherein the preheating portion of the gas inlet tube is wound in a serpentine pattern along an outer circumference of the container.

17. The apparatus of claim 1, wherein the container is formed of quartz.

18. The apparatus of claim 1, wherein the container includes an internal container holding the powder source and an external container surrounding the internal container.

19. The apparatus of claim 18, wherein the internal container is formed of quartz, and the external container is formed of a metallic material.

20. The apparatus of claim 19, wherein the external container is formed of stainless steel.

21. The apparatus of claim 1, wherein a plurality of guide plates formed of a plurality of layers are formed in the container, so as to elongate a gas exhaust path.

22. The apparatus of claim 21, wherein the plurality of guide plates are installed to form a gas exhaust path having a zigzag shape.

23. The apparatus of claim 21, wherein a plurality of steps are formed at a predetermined gap in the container in a height direction, and the plurality of guide plates respectively are supported by the plurality of steps.

24. The apparatus of claim 21, wherein the plurality of guide plates are formed of glass or quartz.

25. The apparatus of claim 1, wherein an outlet end of the gas inlet  
5 tube is installed such that the carrier gas is not injected toward the powder source.

26. The apparatus of claim 25, wherein the outlet end of the gas inlet tube is horizontally installed in a middle portion of the container.

10 27. The apparatus of claim 1, wherein the gas outlet tube is horizontally installed near an upper end of the container.

28. The apparatus of claim 1, wherein the temperature sensor is a thermocouple.  
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29. The apparatus of claim 1, wherein valves for regulating gas flow are installed in each of the connection portions of the gas inlet tube and the gas outlet tube.

20 30. The apparatus of claim 1, wherein a powder source supply hole for supplying a powder source into the container is installed in the cover.